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TITLE: AIR INTAKE SHAFT MINING SEQUENCE CLOSURE POINT MEASUREMENT

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SNL QA Approval: James Lione Date: 3/4/92

PURPOSE: The purpose of this procedure is to document the method used for measuring the mining sequence closure points. Also included in this procedure is the calibration of the measurement pins and the tapes.

**RESPONSIBILITY:** It is the responsibility of the person(s) performing this procedure to be familiar with this procedure. They are also responsible for assuring that fixtures and measurement devices used are certified or in calibration and working properly.

**SAFETY:** All work will be done in accordance with the WIPP Safety Manual and any applicable Safe Operating Procedures. The following concerns also apply.

- I. Closure measurements take place in the Air Intake Shaft (AIS). All work will be done in accordance with WP 04201, Air Intake Shaft Operations.
- II. Access to the shaft will be in accordance with existing WIPP site policies.
- III. Extreme caution must be exercised to assure that nothing is dropped down the shaft.
- IV. Watch for pinch points between the rods and the galloway.

REFERENCES:

- I. Air Intake Shaft Test Plan
- II. WP04 201, Air Intake Shaft Operations

FORMS:

- I. Mining Sequence Closure Gage Data; No. 35 (latest revision)
- II. General Purpose Data Sheet; No. 34 (latest revision)

EQUIPMENT:

- I. Mining Sequence Closure Measurement Kit:  
(This kit is contained in a Ramset box and a plastic carrying tube.)
  - A. Tape measure TM-1 and TM-2 (spare)
  - B. Extension Rods: #1, #2, #3, #4
  - C. Drill bits: #1, #2
  - D. Small borehole brushes
- II. For Calibrations:
  - A. Calibrated 36" caliper
  - B. Calibration frame

HISTORY: The mining sequence closure points were installed during the raise boring of the AIS. To install these points a device was raised up the shaft. This device contained two drill motors that could be extended. Attached to the drill motors was a measuring device that was used to take the original measurements. The device was raised to the designated positions and the drills extended. The drills then bored holes approximately 8" deep and the distance between the bottoms of the two holes was measured. After the shaft was completed a set of rods with mounting fixtures on the ends for the drill bits was fabricated and calibrated. This rod set was then used for the future measurements. During measurements, these drill bits and extension rods are inserted into the bored holes and act as measurement pins. A tape measure is used to measure the distance between the pins. This distance, then summed with the bits and extension rods provide the closure measurement. For more history concerning the Closure Point Emplacement Machine see SNL QA records.

The Mining Sequence Closure Gage Points are located at:

Level	Gage Number
2064	VTM 11
2066	VTM 12
2008	VTM 02
2009	VTM 01

## PROCEDURE:

### Procedure for Field Measurements

#### I. Preparation

- A. Prior to entering the AIS inspect the extension rods and bits for damage. If damage is suspected red-tag the damaged piece(s) and notify SNL cognizant personnel.
- B. Have the galloway moved to the work station (the readings may be started at any of the Mining Sequence Closure Point levels).

**NOTE:** A comfortable working position for taking the measurements is with the closure points at about eye level. Position may be changed at the discretion of the individuals performing this operation.

#### II. Assembly

**NOTE:** The rod assemblies are not matched sets and may be assembled in several configurations. The following assembly instructions are a guide for the most commonly used method. The rod sets can not be incorrectly assembled.

- A. The two measurement pins each consist of two special rods and a drill bit. One rod is approximately 36" long (long rod) and the other is approximately 18 1/2" long (short rod). One end of the short rods is designed to receive the drill bits.
- B. Insert a drill bit into open end of a short rod. Ensure that the drill bit is bottomed in the socket. Firmly tape the drill bit to the rod. (The tape is to secure the bit to the rod to prevent it from falling off during use.)

**NOTE:** The short rod and drill bit may be stored assembled. Therefore; the proceeding step may already be completed.

- C. Snap a short and a long rod together.
- D. Make sure that the rods are locked.
- E. Repeat the above steps to assemble the second measurement pin.

### III. Measurement Pin Emplacement and Closure Readings

- A. Position the galloway so that there are no obstructions between the pair of closure points being measured.
- B. Place the rod sets into opposing closure point holes. Make sure that the drill bit solidly bottoms in the hole.

NOTE: Make a remark on form 35 about anything unusual that was found during the placement of the rods or the measurements; i.e., the drill bits did not "feel" like they bottomed solidly in the holes.

CAUTION: Closely watch the position of the rods in relation to the supports on the galloway. If the rods get jammed they will be damaged. If rods are damaged, red tag and return to SNL for inspection and recertification.

- C. If the drill bits do not solidly bottom use the brushes in the kit to clean the holes. After cleaning the holes attempt to reseat the drill bit.

CAUTION: Do not damage the bottom of the holes while brushing.

- D. Align the two rods. Sight down the rods to check the alignment.
- E. While holding the rods in alignment measure the distance between the two rods with the tape measure. While measuring have one person hold the tip of the tape against the end of one rod while another person measures to the end of the other rod.
- F. Record the measurement in appropriate box on form 35.
- G. Repeat the above measurement until two consecutive readings are within  $\pm 1/16"$ .
- H. Repeat the procedure for the remaining closure points.

### IV. Job Completion

- A. Disassemble the rod sets and store them in the tube.
- B. Complete form 35 and route it to the SNL cognizant engineer for technical review and approval.
- C. After approval the SNL cognizant engineer will route the data form to SNL QA.

## Equipment Calibration Check

### I. Calibration Check of the Measurement Pins

#### A. Form Preparation

1. Fill in top portion of form 34. The title block will be Measurement Pin Calibration Check.
2. In the next block (full page width block) write in Caliper Type \_\_\_\_ S/N \_\_\_\_ Cal. Due \_\_\_\_/\_\_\_\_/\_\_\_\_.
3. Those sections of form 34 that do not apply to this calibration should have "N/A" entered.
4. Label column 1 Drill Bit #1.
5. Label column 2 Drill Bit #2.
6. Label column 3 Extension Rod #1.
7. Label column 4 Extension Rod #2.
8. Label column 5 Extension Rod #3.
9. Label column 6 Extension Rod #4.

#### B. Measurement

1. Using the caliper measure the drill bits from the tip to the end of the base. Record the measurement in the appropriate column.
2. Using the caliper measure the long rods from the base of the female end to the shoulder of the male end. Record the measurement in the appropriate column.
3. Using the caliper measure the short rods from the connecting end to the plug at the opposite end (the plug is accessed through the slot that is approximately 4 1/2" from the end). Record the measurement in the appropriate column.
4. Repeat step 1. through 3. for a total of three measurements.

**NOTE:** All like measurements must be within +/- .01. The readings on the long rods will be taken 120 degrees from each other.

C. Job Completion

1. Complete form 34 and route it to the SNL Calibration Task Leader for technical review and approval.
2. Upon approval of calibration, a certification sticker will be applied stating the new calibration due date (not to exceed two years).
3. After approval the SNL Calibration Task Leader will route the data form to SNL QA.
4. Those measurement pins that exceed the acceptance criteria, will be red tagged and removed from use in this experiment.

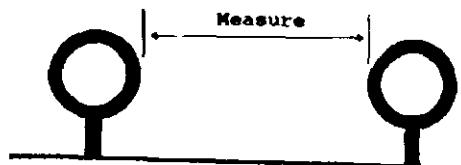
II. Calibration Check of the Tape Measures TM-1 and TM-2

A. Form Preparation

1. Fill in top portion of form 34. The title block will be TM-1 (Tape Measure-1) Calibration Check or TM-2 (Tape Measure-2) Calibration Check as appropriate.
2. In the next block (full page width block) write in Calibration frame S/N \_\_\_\_ Cal. Due \_\_\_\_/\_\_\_\_/\_\_\_\_.
3. Those sections of form 34 that do not apply to this calibration should be marked "N/A".
4. Label column 1 of the Header block "Beam Points".
5. Under the "Beam Points" column, enter A-B, A-C, A-D, A-E, A-F, A-G, A-H, respectively, skipping every other line.
6. Label column 2 Tape Reading 1.
7. Label column 3 Tape Reading 2.
8. Label column 4 Tape Reading 3.

B. Measurement

**NOTE:** The tape measures are fixed to measure inside measurements only. All measurements are to be between the frame eyebolts. See figure below.



Measurement points:

1. Measure from point A to point B. Record in appropriate block on the form.
2. Measure from point A to point C. Record in appropriate block on the form.
3. Measure from point A to point D. Record in appropriate block on the form.
4. Measure from point A to point E. Record in appropriate block on the form.
5. Measure from point A to point F. Record in appropriate block on the form.
6. Measure from point A to point G. Record in appropriate block on the form.
7. Measure from point A to point H. Record in appropriate block on the form.
8. Repeat steps 1 through 7 until all three repetitions of the calibration have been completed.

C. Job Completion

1. Complete form 34 and route it to the SNL Calibration Task Leader for technical review and approval.
2. After approval the SNL Calibration Task Leader will route the data form to SNL QA.
3. The acceptance criteria for this calibration is, all like measurements must agree within  $\pm 1/16"$ .
4. Upon approval of the calibration, a certification sticker will be attached to the instrument stating the new cal due date (not to exceed two years).
5. Those tape measures that exceed the acceptance criteria, will be red tagged and removed from use in this experiment.

REVISION SUMMARY

To be completed by procedure's author before final revision is circulated for signatures.

I. Revisions made: New Procedure

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\_\_\_\_\_

II. Personnel effected:  
(Check appropriate ones)

MOC Craftsman

Drilling \_\_\_\_\_  
Shop \_\_\_\_\_  
Mechanical \_\_\_\_\_  
Electrical \_\_\_\_\_  
Gage ☒ \_\_\_\_\_  
Cable/TC \_\_\_\_\_  
U/G DAS \_\_\_\_\_  
Geotech ☒ \_\_\_\_\_

SNL JOB AREAS

DAS General \_\_\_\_\_  
DAS B49 Trailer \_\_\_\_\_  
DAS Sheds \_\_\_\_\_  
DAS Equip. Cal. & Inv. \_\_\_\_\_  
Thermocouple \_\_\_\_\_  
Cables \_\_\_\_\_  
Drilling \_\_\_\_\_  
Gage Installation \_\_\_\_\_  
Gage Cal. & Removal ☒ \_\_\_\_\_  
Plugging & Sealing \_\_\_\_\_  
Brine Transport \_\_\_\_\_  
General \_\_\_\_\_

III. Retraining required:  
(Circle one)

☒ Read/Re-read procedure

☐ Practical demonstration

☐ Other (explain)

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Signature of

Procedure's Author

Don Pappas

Date

2/24/92